



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2022-0148; Project Identifier AD-2021-00922-T; Amendment 39-22110; AD 2022-14-05]

RIN 2120-AA64

Airworthiness Directives; The Boeing Company Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is superseding Airworthiness Directive (AD) 2015-12-03, which applied to certain The Boeing Company Model 777-200, -200LR, -300, and -300ER series airplanes. AD 2015-12-03 required repetitive freeplay inspections and lubrication of the right and left elevators, rudder, and rudder tab, and related investigative and corrective actions if necessary. This AD was prompted by engineering testing which revealed that the force being applied to the elevator to detect excessive freeplay was insufficient. This AD continues to require certain actions in AD 2015-12-03 for certain airplanes, and requires revising the existing maintenance or inspection program, as applicable, for certain other airplanes, to incorporate a revised or new elevator freeplay maintenance procedure, as applicable. This AD also adds airplanes to the applicability. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of a certain other publication listed in this AD as of July 21, 2015 (80 FR 34252, June 16, 2015).

ADDRESSES: For service information identified in this final rule, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminister Blvd., MC 110-SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; Internet <https://www.myboeingfleet.com>. You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195. It is also available at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2022-0148.

Examining the AD Docket

You may examine the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2022-0148; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, any comments received, and other information. The address for Docket Operations is U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: Luis Cortez-Muniz, Aerospace Engineer, Airframe Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: (206) 231-3958; email: Luis.A.Cortez-Muniz@faa.gov.

SUPPLEMENTARY INFORMATION:

Background

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to supersede AD 2015-12-03, Amendment 39-18176 (80 FR 34252, June 16, 2015) (AD 2015-12-03). AD 2015-12-03 applied to certain The Boeing Company Model 777-200, -200LR, -300, and -300ER series airplanes. The NPRM published in the *Federal Register* on March 24, 2022 (87 FR 16654). The NPRM was prompted by the manufacturer's determination that the procedure for the rudder freeplay inspection available at the time did not properly detect excessive freeplay in the rudder control load loop. The NPRM was also prompted by engineering testing which revealed that the force being applied to the elevator to detect excessive freeplay was insufficient. In the NPRM, the FAA proposed to continue to require certain actions in AD 2015-12-03 for certain airplanes, and to require revising the existing maintenance or inspection program, as applicable, for certain other airplanes, to incorporate a revised or new elevator freeplay maintenance procedure, as applicable. The NPRM also proposed to add airplanes to the applicability. The FAA is issuing this AD to address excessive wear in the load loop components of the control surfaces, which could lead to excessive freeplay of the control surfaces, flutter, and consequent loss of control of the airplane.

Discussion of Final Airworthiness Directive

Comments

The FAA received comments from The Air Line Pilots Association, International (ALPA) and Boeing, who supported the NPRM without change.

The FAA received additional comments from United Airlines. The following presents the comments received on the NPRM and the FAA's response.

Request for Exception to Correct Service Information Typographical Error

United Airlines (UAL) asked that the FAA consider including an exception in paragraph (i) of the proposed AD due to a typographical error in Boeing Special Attention Service Bulletin 777-27-0062, Revision 4, dated July 15, 2021. UAL stated that it identified a typographical error in Appendix A, paragraph 1.f., "Freeplay Inspection," in the CAUTION note just before step (6). UAL added that the note shows the conversion of 84 square inches as 5,420 square centimeters; however, 84 square inches calculates to 542 square centimeters.

The FAA agrees that Appendix A of the referenced service information contains a typographical error, as described by the commenter. Therefore, that FAA has added an exception to paragraph (i)(5) of this AD which states that where Appendix A, paragraph 1.f., "Freeplay Inspection," of Boeing Special Attention Service Bulletin 777-27-0062, Revision 4, dated July 15, 2021, specifies to use a pad that distributes the force over an area of 84 square inches (5,420 square centimeters) or more, this AD requires using a pad that distributes the force over an area of 84 square inches (542 square centimeters) or more. The FAA also revised the introductory text to paragraph (i)(5) to specify that a new exception has been added.

Conclusion

The FAA reviewed the relevant data, considered any comments received, and determined that air safety requires adopting this AD as proposed. Except for minor editorial changes, and any other change described previously, this AD is adopted as proposed in the NPRM. None of the changes will increase the economic burden on any operator.

Related Service Information under 1 CFR Part 51

The FAA reviewed Boeing Special Attention Service Bulletin 777-27-0062, Revision 4, dated July 15, 2021. This service information specifies procedures for

changing the elevator freeplay instructions by adding changes to the input force, elevator freeplay limit, and power control unit (PCU) bypass test setup.

This AD also requires Boeing Special Attention Service Bulletin 777-27-0062, Revision 2, dated January 27, 2014, which the Director of the Federal Register approved for incorporation by reference as of July 21, 2015 (80 FR 34252, June 16, 2015).

This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in ADDRESSES.

Costs of Compliance

The FAA estimates that this AD affects 281 airplanes of U.S. registry. The FAA estimates the following costs to comply with this AD:

Estimated costs				
Required actions	Labor cost	Parts cost	Cost per product	Cost on U.S. operators (218)
Measurement (inspection), elevator	4 work-hours X \$85 per hour = \$340 per measurement (inspection) cycle	\$0	\$340 per measurement (inspection) cycle	\$74,120 per measurement (inspection) cycle
Lubrication, elevator	17 work-hours X \$85 per hour = \$1,445 per lubrication cycle	\$0	\$1,445 per lubrication cycle	\$315,010 per lubrication cycle
Measurement (inspection), rudder	4 work-hours X \$85 per hour = \$340 per measurement (inspection) cycle	\$0	\$340 per measurement (inspection) cycle	\$74,230 per measurement (inspection) cycle
Lubrication, rudder	7 work-hours X \$85 per hour = \$595 per lubrication cycle	\$0	\$595 per lubrication cycle	\$129,710 per lubrication cycle

Required actions	Labor cost	Parts cost	Cost per product	Cost on U.S. operators (218)
Measurement (inspection), rudder tab	3 work-hours X \$85 per hour = \$255 per measurement (inspection) cycle	\$0	\$255 per measurement (inspection) cycle	\$55,590 per measurement (inspection) cycle
Lubrication, rudder tab	5 work-hours X \$85 per hour = \$425 per lubrication cycle	\$0	\$425 per lubrication cycle	\$92,650 per lubrication cycle

The FAA has received no definitive data that would enable the agency to provide cost estimates for the on-condition corrective actions specified in this AD.

The FAA has determined that revising the existing maintenance or inspection program takes an average of 90 work-hours per operator, although the agency recognizes that this number may vary from operator to operator. Since operators incorporate maintenance or inspection program changes for their affected fleet(s), the FAA has determined that a per-operator estimate is more accurate than a per-airplane estimate. Therefore, the FAA estimates the average total cost per Model 777F operator to be \$7,650 (90 work-hours x \$85 per work-hour).

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds

necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

This AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Will not affect intrastate aviation in Alaska, and
- (3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by:

- a. Removing Airworthiness Directive (AD) 2015-12-03, Amendment 39-18176 (80 FR 34252, June 16, 2015); and

b. Adding the following new AD:

2022-14-05 The Boeing Company: Amendment 39-22110; Docket No. FAA-2022-0148; Project Identifier AD-2021-00922-T.

(a) Effective Date

This airworthiness directive (AD) is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

This AD replaces AD 2015-12-03, Amendment 39-18176 (80 FR 34252, June 16, 2015) (AD 2015-12-03).

(c) Applicability

This AD applies to The Boeing Company airplanes, certificated in any category, identified in paragraphs (c)(1) and (2) of this AD.

(1) All Model 777-200, -200LR, -300, and -300ER series airplanes.

(2) Model 777F airplanes with an original airworthiness certificate or original export certificate of airworthiness issued on or before the effective date of this AD.

(d) Subject

Air Transport Association (ATA) of America Code 27, Flight Controls.

(e) Unsafe Condition

This AD was prompted by the manufacturer's determination that the procedure for the rudder freeplay inspection available at the time did not properly detect excessive freeplay in the rudder control load loop. This AD was also prompted by engineering testing that revealed that the force being applied to the elevator to detect excessive freeplay was insufficient. The FAA is issuing this AD to address excessive wear in the load loop components of the control surfaces, which could lead to excessive freeplay of the control surfaces, flutter, and consequent loss of control of the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Retained Repetitive Inspections of Elevators, Rudder, and Rudder Tab, with Revised Service Information

This paragraph restates the requirements of paragraph (g) of AD 2015-12-03, with revised service information. For Model 777-200, -200LR, -300, and -300ER series airplanes: At the applicable times specified in tables 1, 2, and 3 of paragraph 1.E., “Compliance,” of Boeing Special Attention Service Bulletin 777-27-0062, Revision 2, dated January 27, 2014, or Revision 4, dated July 15, 2021, except as provided by paragraph (i)(1) of this AD: Inspect the freeplay of the right and left elevators, rudder, and rudder tab by accomplishing all of the actions specified in Parts 1, 3, and 5 of the Accomplishment Instructions of Boeing Special Attention Service Bulletin 777-27-0062, Revision 2, dated January 27, 2014, or Revision 4, dated July 15, 2021, except as provided by paragraphs (i)(2) through (5) of this AD. Repeat the inspections thereafter at the intervals specified in tables 1, 2, and 3 of paragraph 1.E., “Compliance,” of Boeing Special Attention Service Bulletin 777-27-0062, Revision 2, dated January 27, 2014, or Revision 4, dated July 15, 2021. If, during any inspection required by this paragraph, the freeplay exceeds any applicable measurement specified in Part 1, 3, and 5, as applicable, of the Accomplishment Instructions of Boeing Special Attention Service Bulletin 777-27-0062, Revision 2, dated January 27, 2014, or Revision 4, dated July 15, 2021, before further flight, do the applicable corrective actions in accordance with Part 1, 3, and 5 of the Accomplishment Instructions of Boeing Special Attention Service Bulletin 777-27-0062, Revision 2, dated January 27, 2014, or Revision 4, dated July 15, 2021. After the effective date of this AD use only Boeing Special Attention Service Bulletin 777-27-0062, Revision 4, dated July 15, 2021.

(h) Retained Repetitive Lubrication, with Revised Service Information

This paragraph restates the requirements of paragraph (h) of AD 2015-12-03, with revised service information. For Model 777-200, -200LR, -300, and -300ER series airplanes: At the applicable times specified in tables 1, 2, and 3 of paragraph 1.E., “Compliance,” of Boeing Special Attention Service Bulletin 777-27-0062, Revision 2, dated January 27, 2014, or Revision 4, dated July 15, 2021, except as provided by paragraph (i)(1) of this AD: Lubricate the elevator components, rudder components, and rudder tab components, by accomplishing all of the actions specified in Parts 2, 4, and 6 of the Accomplishment Instructions of Boeing Special Attention Service Bulletin 777-27-0062, Revision 2, dated January 27, 2014, or Revision 4, dated July 15, 2021. Repeat the lubrication thereafter at the interval specified in tables 1, 2, and 3 of paragraph 1.E., “Compliance,” of Boeing Special Attention Service Bulletin 777-27-0062, Revision 2, dated January 27, 2014, or Revision 4, dated July 15, 2021. After the effective date of this AD use only Boeing Special Attention Service Bulletin 777-27-0062, Revision 4, dated July 15, 2021.

(i) Exceptions to Service Information Specifications, with Revised Service Information and a New Exception

This paragraph restates the requirements of paragraph (i) of AD 2015-12-03, with revised service information and a new exception, for Model 777-200, -200LR, -300, and -300ER series airplanes.

(1) Where Boeing Special Attention Service Bulletin 777-27-0062, Revision 2, dated January 27, 2014, and Revision 4, dated July 15, 2021, specify a compliance time “after the original issue date on this service bulletin,” this AD requires compliance within the specified compliance time after July 25, 2007 (the effective date of AD 2007-13-05, Amendment 39-15109 (72 FR 33856, June 20, 2007)). After the effective date of this AD, only Boeing Special Attention Service Bulletin 777-27-0062, Revision 4, dated July 15, 2021, may be used.

(2) Where Appendix B, paragraph 1.f., “Freeplay Inspection,” step (8), of Boeing Special Attention Service Bulletin 777-27-0062, Revision 2, dated January 27, 2014, specifies that the center of the pad must be within 1.0 inch (13 millimeters) of the center line of the rib rivets in the rudder tab, this AD requires that the center of the tab must be within 1.0 inch (25 millimeters) of the center line of the rib rivets in the rudder tab.

(3) Where Appendix C, paragraph 1.e., “Rudder Tab Surface Freeplay – Inspection,” step (2) and step (6), of Boeing Special Attention Service Bulletin 777-27-0062, Revision 2, dated January 27, 2014, specify that the placement of the force gage and pad should be within one inch of the centerline line of the middle rudder power control unit (PCU) rib and at 12 +/- 1 inch (305 +/- 72 millimeters) forward of the rudder tab trailing edge, this AD requires placement of the force gage and pad within one inch of the centerline line of the middle rudder PCU rib and at 12 +/- 1 inch (305 +/- 25 millimeters) forward of the rudder tab trailing edge.

(4) Where Appendix C, paragraph 1.e., “Rudder Tab Surface Freeplay – Inspection,” step (3), of Boeing Special Attention Service Bulletin 777-27-0062, Revision 2, dated January 27, 2014, specifies to apply a 30 +/- pound (133 +/- 14 newton) force, this AD requires applying a 30 +/- 3 pound force (133 +/- 14 newton) force.

(5) Where the CAUTION note just before step (6) of Appendix A, paragraph 1.f., "Freeplay Inspection," of Boeing Special Attention Service Bulletin 777-27-0062, Revision 4, dated July 15, 2021, specifies using a pad that distributes the force over an area of 84 square inches (5,420 square centimeters) or more, this AD requires using a pad that distributes the force over an area of 84 square inches (542 square centimeters) or more.

(j) New Maintenance or Inspection Program Revision

For Model 777F airplanes: Within 30 days after the effective date of this AD, revise the 777F elevator freeplay maintenance procedure in the existing maintenance or

inspection program, as applicable, by doing the actions specified in paragraphs (j)(1) through (3) of this AD.

(1) Remove the existing hydraulic depressurization PCU test setup procedure step and replace it by incorporating the information specified in figure 1 to paragraph (j) of this AD.

(2) Revise the jack test force used to push the elevator up to 225 +/- 10 lb (102.1 +/- 4.5 kg).

(3) Revise the elevator freeplay dial indicator limit to 0.34 in. (152 mm) or less.

Figure 1 to paragraph (j): *Circuit breaker elevator freeplay test setup*

Do these steps to prepare for the freeplay inspection:

NOTE: Each PCU can be inspected in any order, as long as the setup for the inspection is performed per the steps below.

a) To inspect the left elevator outboard PCU, do these steps:

1. Open this circuit breaker and install safety tag:

Power Supply Assembly Center, M24301

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	CBA7-C	ELEV PCU

2. Make sure that the left elevator inboard PCU is in bypass mode

b) To inspect the left elevator inboard PCU, do these steps:

1. Open this circuit breaker and install safety tag:

Power Supply Assembly Left, M24101

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	CBA7-L	ELEV PCU

2. Make sure that the left elevator outboard PCU is in bypass mode.

c) To inspect the right elevator inboard PCU, do these steps:

1. Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	27	C27609	ELEV PCU RIB (BLK)/ROB(BYP)

2. Make sure that the right elevator outboard PCU is in bypass mode.

d) To inspect the right elevator outboard PCU, do these steps:

1. Open this circuit breaker and install safety tag:

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	CBA7-R	ELEV PCU

2. Make sure that the right elevator inboard PCU is in bypass mode.

Note 1 to paragraph (j): Refer to AMM task 27-31-09-200-801, dated

September 5, 2021, for additional guidance.

(k) No Alternative Actions or Intervals

After the existing maintenance or inspection program has been revised as required by paragraph (j) of this AD, no alternative actions (e.g., inspections) or intervals may be used unless the actions or intervals are approved as an alternative method of compliance (AMOC) in accordance with the procedures specified in paragraph (m) of this AD.

(l) Credit for Previous Actions

This paragraph provides credit for the actions specified in paragraphs (g) and (h) of this AD, if those actions were performed before the effective date of this AD using Boeing Special Attention Service Bulletin 777-27-0062, Revision 3, dated October 9, 2015.

(m) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Seattle ACO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or responsible Flight Standards Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in paragraph (n)(1) of this AD. Information may be emailed to: 9-ANM-Seattle-ACO-AMOC-Requests@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the responsible Flight Standards Office

(3) An AMOC that provides an acceptable level of safety may be used for any repair, modification, or alteration required by this AD if it is approved by The Boeing Company Organization Designation Authorization (ODA) that has been authorized by the Manager, Seattle ACO Branch, FAA, to make those findings. To be approved, the repair

method, modification deviation, or alteration deviation must meet the certification basis of the airplane, and the approval must specifically refer to this AD.

(4) AMOCs approved previously for the freeplay measurements of the right and left rudder tab required by AD 2015-12-03, are approved as AMOCs for the corresponding provisions of this AD.

(5) AMOCs approved previously for the freeplay measurements of the rudder required by AD 2015-12-03, are approved as AMOCs for the corresponding provisions of this AD.

(6) AMOCs approved previously for the repetitive lubrications required by AD 2015-12-03, are approved as AMOCs for the corresponding provisions of this AD.

(n) Related Information

(1) For more information about this AD, contact Luis Cortez-Muniz, Aerospace Engineer, Airframe Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: (206) 231-3958; email: Luis.A.Cortez-Muniz@faa.gov.

(2) Service information identified in this AD that is not incorporated by reference is available at the addresses specified in paragraphs (o)(5) and (6) of this AD.

(o) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless this AD specifies otherwise.

(3) The following service information was approved for IBR on [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(i) Boeing Special Attention Service Bulletin 777-27-0062, Revision 4, dated July 15, 2021.

(ii) [Reserved]

(4) The following service information was approved for IBR on July 21, 2015 (80 FR 34252, June 16, 2015).

(i) Boeing Special Attention Service Bulletin 777-27-0062, Revision 2, dated January 27, 2014.

(ii) [Reserved]

(5) For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminister Blvd., MC 110-SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; Internet <https://www.myboeingfleet.com>.

(6) You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195.

(7) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email fr.inspection@nara.gov, or go to: <https://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued on June 27, 2022.

Christina Underwood, Acting Director,
Compliance & Airworthiness Division,
Aircraft Certification Service.

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